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TECHNOLOGY DEPT.

November 29, 1952

VOL. 62, NO. 22. PAGES 337-352

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Scanning the Sun

See Page 339

A SCIENCE SERVICE PUBLICATION

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How Pathfinder Magazine says: *You* CAN DISCOVER THE SECRET OF LOW-COST TRAVEL

from an article in the bi-weekly news magazine, THE PATHFINDER:

Dream trips you can afford:

ROUND THE WORLD FOR \$475

THE LITTLE Tyrhennia Line steamer *Olbia* takes a couple of days to butt through the Mediterranean, from Genoa via Leghorn to brigand-riddled Corsica. If you're aboard, don't stay up late watching the wild mountain dances of Ligurian peasants on the steerage deck. For you must be on deck at dawn—while you pass the lone island of Capraia, with salt-blown Elba to the south—to watch for the high Corsican peaks to show above the horizon.

At \$6.50 (including five full meals), the *Olbia's* voyage is a fair example of dream trips you can afford. And there are others—colorful journeys to exotic lands that often cost little more than your vacation at home. Trade your usual beach for a houseboat in the Vale of Kashmir, or a cruise among the lesser Caribbean islands by native trading schooner.

You can travel clear around the world—to South Seas coral isles and the misty lakes of New Zealand, to Australia and the plains of Africa, to Europe's leisurely antiquity—for just \$475 in fares. That long steamer jaunt can be duplicated in ten days by plane for \$1,700, but where's the fun?

Last year, 52 million Americans spent a record of \$12 billion on vacations. Many went on organized cruises at prices from \$125 to \$25,000. But some traveled off the tourist track, got cheaper and more glamorous vacations.

JUST REMEMBER

• • Bargain paradises get that way because they haven't been discovered by tourist mobs. They're harder to find and to reach—but more rewarding.

• • Chromed ocean liners and international hotels are America transplanted. For fun at budget prices, go by freighter and stay at pensions.

• • Make your longest hop from Europe, not directly from the U.S. Currency differentials and lower European rates can save up to 50%.

• • Don't go unless you're ready to plan well ahead and to shop for travel bargains.

CARIBBEAN. There are still undiscovered Edens at America's back door. Tobago, the Robinson Crusoe island that rivals Tahiti, where living is so cheap the island's chief official gets only \$240 a month. Or Grenada, which, as a native described it: "Dis islan', suh, is y'ing Gahd mek from rainba'." There, for \$12 a week, you can rent a three-bedroom house with its own private beach. Many of the best spots can be reached only by trading schooner: Go down to the waterfront at Grenada or elsewhere and bargain with dusky skippers to make your own price—keep this up and cruise all the lesser islands of this jeweled chain.

Here is a sampling of dream trips

Round the World. Every four weeks a New Zealand Shipping Co. vessel passes through the Panama Canal for New Zealand. Cross the Pacific, change at Wellington for another NZS ship going west via Australia and South Africa back to England, Curacao, and Panama. Minimum fare \$475—but the trip is usually booked up 15 months in advance. (Other round the world trips as low as \$250 a month via deluxe freighters.)

India. Minimum fare from New York to Ceylon, India, or Malaya is about \$350. Transshipping in England, you can make the trip by luxury liner (tourist class) for \$319. Go to the lotus-covered mountain lakes of Kashmir, where a furnished houseboat with four turbaned servants rents for \$70 a month. Total costs for a couple run around \$175 a month—in the most beautiful spot on earth.

South Seas. You can still live the life of a Tahitian beachcomber—but not in Tahiti, which has found out about the Yankee dollar. Instead, drowse on brilliant Sigatoka Beach at Suva or watch Pacific combers crash on reef-girt Norfolk or Lord Howe Islands. (You can reach the South Seas by freighter from the U.S.)

Africa. Perhaps the biggest travel bargain today is an 80-day luxury cruise around the Dark Continent, calling at a score of colorful ports like Dar-es-Salaam, for \$700, round trip from Amsterdam. (You can reach Holland for \$165 from the U.S.)

Mediterranean. A two-week cruise to Malta, Naples, Casablanca, and Lisbon starts as low as \$92, round trip from London. But try a longer stay—in the lush valleys of Mount Olympus on Cyprus, where a couple can live comfortably for \$1,400 a year; on Aegean islands that hide remnants of a 5,000-year-old civilization among olive and cork groves; or with the fisherfolk of rocky Sardinia, where hotel rates are 24¢ a day or \$1.12 with three good meals.

Atlantic Islands. Green cones standing out of the sparkling waters of the South Atlantic—these are the Azores and the Canaries. Tropical flowers, sandy beaches, and the charm of old Spain are combined here—with rents of about \$20 a month, groceries for a couple at \$10 a week and servants \$5 a month each.

The vagabond voyager with a fistful of dreams can get aids to planning from these 2 guides:

BARGAIN PARADISES OF THE WORLD.

This is a book on how to double what your money can buy. For that is what spending a few weeks or months, or even retiring, in the world's Bargain Paradises amounts to.

Throughout, you learn where to spend a while in the West Indies, Central and South America, the healthful islands of the South Seas, the wonderlands of New Zealand, the Balearic Islands, the Canaries, Madeira, etc.

You read about "Lands of Eternal Springtime," "Californias Abroad," "Islands in the Wind," "Four Modern Shangri-Las," about mountain hideaways, tropical islands as colorful as Tahiti but nearer home, about modern cities where you can live for less, about quiet country lanes and surf-washed coastal resorts.

About 100 photos, 4 maps. Price \$1.50.

TRAVEL ROUTES AROUND THE WORLD.

With this book you can stop saying that travel is too expensive. Passenger-carrying freighters do offer you a way to see the world for as little as you'd spend at a resort. And what accommodations you get—large rooms with beds (not bunks), probably a private bath, lots of good food, plenty of relaxation as your ship speeds from port to port.

Trips to Rio and Buenos Aires, to the West Indies, between California and New York, out to Hawaii—trips to almost everywhere—are within your means.

There are round the world voyages and shorter trips too. Fast, uncrowded voyages to England, France, the Mediterranean; two or three week vacations to the West Indies or down the Pacific Coast.

This book names the lines, tells where they go, how much they charge, briefly describes accommodations. It includes practically every passenger carrying service starting from or going to New York, Canada, New Orleans, the Pacific Coast, England, France, Scandinavia, the Mediterranean, Africa, the Near East, the Indies, Australia, the South Seas, Japan, Hawaii, etc. It's yours for \$1.

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ELECTRONICS

Spot Crash Location

New device will make pinpointing of airplane crash spots automatic. Consists of radio transmitter that operates immediately after crash and series of receiving stations.

► THE U. S. Air Rescue Service of the Air Force is developing an electronic system that takes the guesswork out of finding airplanes that crash in desolate country or into the ocean.

The new system should permit rescues to be made in record-breaking time, thus saving many lives that might otherwise be lost, SCIENCE SERVICE has learned.

By radio, the new system pinpoints the spot at which a plane crashes. It permits rescue teams to fly directly to the scene of the crash without the usual—and sometimes fruitless—search for the missing craft.

Basically the system has two parts: a self-contained radio transmitter beacon that goes into action when the plane crashes, and automatic direction finding stations spotted along the ground.

The beacon sends out vital information about the crash which is received at several remote direction finding stations. The stations feed the information into a central station. There the operator can spot on the map almost exactly where the plane crashed.

Dispatched planes can "home in" on the beacon signals while flying to the rescue.

Carried near the tail of the plane, the Crash Beacon Locator, as it is called, can be released manually by the pilot if he has time. If not, the beacon ejects itself when the airplane strikes the ground or the ocean.

The beacon parachutes to earth, disconnects its parachute harness and, through complex electronic circuits, decides whether it has come to a final rest. Then it turns itself upright, extends its antenna and begins sending distress messages on the international distress frequency.

Instead of sending the usual SOS, the beacon sends the serial number of the plane and a code letter representing the time elapsed since the plane crashed. From the serial number, rescue teams can find out what plane crashed, how many persons were aboard and what type of rescue aid will be needed.

Feeling the need for such a system, the Air Rescue Service drew up the requirements and turned them over to the Air Development Center at Wright-Patterson Air Force Base, Dayton, Ohio. A prototype beacon already has been designed, built and tested. Direction finding stations now are being developed.

The beacon is encased in a cylinder five inches in diameter and two feet long. The electronic parts are protected so they will withstand the shocks of the crash, of being ejected and of striking the ground. The beacon will work automatically on land or water for 48 hours without any attention.

Although developmental work is moving

right along, the system probably cannot be used for another two and a half years, the Air Force estimates. Certain "bugs" still have to be worked out, and the whole system has yet to be put into mass production.

Science News Letter, November 29, 1952

RADIO ASTRONOMY

Unique Interferometer Aids Radio Wave Study

See Front Cover

► FOR STUDYING radio waves from the sun, a unique type of interferometer has begun operations at Potts Hill near Sydney, Australia. The radio telescope, shown on the cover of this week's SCIENCE NEWS LETTER, consists of 32 identical parabolic aerials each about six and a half feet in diameter and spaced about 23 feet apart.

Built by the radiophysics division of the Commonwealth Scientific and Industrial

Research Organization, the interferometer records the distribution of radiation received from across the sun's disk at the wavelength of 21 centimeters. One of the main features of this radio telescope is that it allows the source of radio noise to be pinpointed on the solar disk.

Studies using it have already confirmed a theoretical prediction that more radio energy comes from the edges of the sun's disk than from its center. If we had "radio eyes," we would see the sun as a bright ring with a less bright patch in the middle, and occasionally a few quite luminous patches on its face.

Science News Letter, November 29, 1952

PSYCHOLOGY

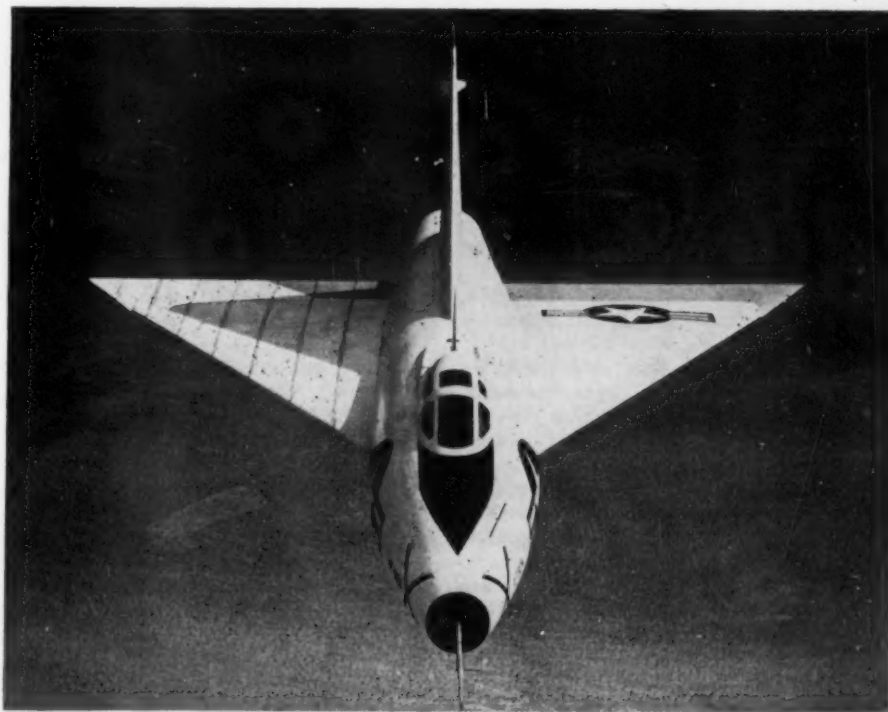
People Talk Selves Into Neurotic State

► IF YOU think some people talk themselves into a neurotic state, you are about right.

If they could not talk, they would not get neurotic, Prof. O. Hobart Mowrer, University of Illinois psychologist, has stated.

"Language makes it possible for man to become neurotic because it enables him to practice deception, one of the causes of neurosis," he stated at a symposium opening the new University of Maryland Psychiatric Institute in Baltimore.

Science News Letter, November 29, 1952



SNAPPED HEAD-ON—From the tail gunner's position in a B-25, a photographer made this flight view of Convair's XF-92-A research interceptor, being flown by Maj. Charles E. Yeager, first man to fly faster than sound, over California's Mojave Desert. Parallel lines on wing at left are wool tufts that show air flow direction. The plane is a forerunner of the supersonic F-102 delta wing interceptor now ordered into production.

PUBLIC HEALTH

Food and Drug Inspection

Supreme Court hears arguments in case hinging on whether or not government inspectors have right to enter and inspect factories and warehouses.

► **THE PURITY** of our foods, drugs and cosmetics and our protection from dangerous drugs are to a large extent at stake through a case argued before the Supreme Court.

Depending on the Court's decision, the Food, Drug and Cosmetic Law may have to be changed by Congress. During the delay this would occasion, an important provision of the present law could not be enforced.

The case hinges on whether Food, Drug and Cosmetic Administration inspectors have or do not have the right to enter and inspect factories and warehouses and take samples of products and examine shipping records.

The plaintiff, Ira D. Cardiff, operator of a food processing plant in Yakima County, Wash., claims they do not have this right. He points out that in one place in the present law, inspectors are given this right to enter and inspect at reasonable times only after first obtaining permission from the management authorities.

When he refused permission on several occasions, the Food and Drug Administration took the case to the courts. The District Court decided in favor of the FDA because another place in the law makes it a prohibitive offense to refuse entry to FDA inspectors. But the Ninth Circuit Court of Appeals declared it had to decide in favor of Mr. Cardiff because a criminal offense was involved.

FDA officials think the intent of the clause about obtaining permission to enter was to allow arrangements for inspection at a reasonable time when the plant or warehouse manager could be present.

Without the right to enter and inspect, FDA officials would not be able to tell whether or not a factory or warehouse for food, drugs and cosmetics was run in a sanitary way. They would also have difficulty in establishing whether a food, drug or cosmetic had been shipped in interstate commerce. FDA has jurisdiction only over products shipped for sale across state lines.

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ENGINEERING

Now Prestressed Ceramics

► **YOU HAVE** heard of prestressed concrete. Now it is prestressed ceramics.

Experiments by F. R. Shanley and W. J. Knapp of the University of California at Los Angeles' department of engineering point toward a new, low-cost building process that may eliminate steel framework, mortar and painting in certain phases of construction.

Prestressing means that steel wires are run through a series of ceramic blocks, clamping them tightly together as you would hold several blocks together between your hands.

Prestressed ceramics are actually stronger than structural steel when loaded so as to eliminate tension, the U.C.L.A. engineers point out. In the laboratory small, lightweight beams of tile blocks and tensioned steel have proved capable of supporting enormous loads. In another phase of the research, a large section of tile blocks proved adequate as a wall for houses or flooring for bridges.

The tile section has tensioned cables running both lengthwise and crosswise. Pressure is exerted by simply tightening bolts at the end. No mortar is needed to hold the blocks together as pressure does this. Asbestos gaskets are used between the blocks to help distribute pressure evenly.

Painting may be eliminated because glazed tile, preprocessed in almost any desirable design or color combinations, can be used.

An abundant and inexpensive supply of ceramic raw materials makes the process economically attractive. Ceramic materials are also resistant to corrosion and such prestressed structures are expected to be resistant to earthquake and blast effects.

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INVENTION

Frozen Food Package Thaw Indicator Devised

► **PROTECTION** FOR the housewife from buying a package of quick frozen food which has inadvertently been thawed somewhere between the factory and the store's food locker is provided with an indicator recently invented. Charles C. Chapple, Wyndmoor, Pa., received patent number 2,617,734 for it.

Mr. Chapple points out that some quick frozen foods, when once thawed and then refrozen, are not satisfactory products. Sometimes they even spoil in the thawing process and become dangerous. Before his indicator, Mr. Chapple says, neither the customer nor the storekeeper could know

whether a food package had remained frozen all the way.

The indicator is a label made of a substance highly sensitive to water called sodium carboxy methyl cellulose. Printed on the label is: "This package has not been thawed." Directly under the label, printed on the package, is the word: "Thawed."

When the package is thawed, moisture collects on the outside from the surrounding air, and on the inside from the product. The moisture so distorts the material from which the label is made that the printing disappears and the label becomes transparent, allowing the customer to see the word "thawed" underneath.

Science News Letter, November 29, 1952

SCIENCE NEWS LETTER

VOL. 62 NOVEMBER 29, 1952 No. 22

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St., N. W., Washington 6, D. C., NORTH 2253. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs., \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 3440, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566, and 360 N. Michigan Ave., Chicago, State 2-4822.

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HYGIENE

Private Office Quiet For Executive Pays

► PRIVATE OFFICES are justified for executives because they are quiet and therefore allow the executive to work more efficiently, it appears from studies reported to the Industrial Hygiene Foundation in Pittsburgh.

A noise which lowers the efficiency of a routine worker by five percent will decrease the output of an executive by as much as 30%, the Bell Telephone Laboratories estimated. The estimate was cited in a report by S. L. Hooper of Remington Rand, Inc., former president of the Noise Abatement Council.

Office noise may be costing American business \$4,000,000 a day in inefficient operation, Mr. Hooper said. He puts noise in the same class as bad ventilation and poor lighting in its effects on human efficiency.

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MEDICINE

Plastic Dresses Burns; Doctors Peek at Healing

► A TRANSPARENT, flexible plastic dressing for burns and other wounds that can be sprayed on from an aerosol bomb was announced by Capt. Daniel S. J. Choy, USAF (MC) of the Aero Medical Laboratory, Wright-Patterson Air Force Base, Ohio, at the meeting of the Association of Military Surgeons of the United States in Washington.

Only disadvantage given is the fact that the dressing is inflammable. It keeps out germs, lets the surgeon see how the wound is healing, is more comfortable than pressure dressings and peels off easily. It is a polyvinyl plastic in an ethyl acetate solution.

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HEREDITY

Chemical in Cell Clue To Way Heredity Works

► A NEW chemical substance, once tossed out as "residue" in chemical studies of living cells, may offer a clue to the workings of heredity.

Dr. Jay Barton II, Columbia University zoologist, reporting his five years of experimentation with a previously unsuspected substance from cell nuclei (a kind of deoxyribonucleic acid, or DNA), believes this chemical may be the chemical agent of heredity.

DNA meets all of the general requirements expected of the chemical unit of heredity, Dr. Barton said. He added that the principal job now is to break down DNA into component parts representing the different factors that are inherited in reproduction.

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PROPAGANDA BOMBARDMENT—Members of a psychological warfare team of the U. S. Army set up a loudspeaker for broadcasting to enemy troops on the Korean front.

MARINE BIOLOGY

"Red Tide" Disappears

Winds believed responsible for break-up of red-colored areas of sea water. Scientists were prepared to disperse the lethal patches with copper sulfate solution.

► THE "RED TIDE" that swept the Florida gulf coast for eight days, leaving millions of dead fish in its wake, has disappeared.

A Coast Guard plane that surveyed the affected area from the air reported no evidence of red tide could be found. The break-up of the red tide was probably due to strong southeast winds that buffeted the Florida coast Nov. 18 and 19, the U. S. Fish and Wildlife Service said.

Red tide is caused by one-celled marine organisms, *Gymnodinium brevis*, that congregate by the billions in clearly defined, red-colored areas of sea water that are less salty than the water around them. These bodies of brackish water have a high concentration of food materials for the *Gymnodinium*. The Fish and Wildlife Service said the southeast winds caused a general mixing of the water, resulting in the dispersal and disappearance of the organisms.

By this sudden disappearance of red tide before the ocean wind, nature beat the scientists to the draw. The research vessel,

Alaska, left a Texas port for the affected area soon after the first reports of red tide, with her ballast tanks loaded with copper sulfate solution to be used against the tide. The chemical was meant to be distributed at the edges of the red tide to destroy the delicate balance between the low-salt water and the general ocean water. This, the scientists thought, would cause the break-up of the tide.

But when the Alaska arrived, it found only small patches of red tide, too small to try out the copper sulfate experiment. The wind had already done the mixing for the scientists.

Another red tide killed an estimated half-billion fish on the Florida coast in 1946-47. It was larger than the 1952 red tide and lasted for several months. The 1952 red tide covered an area of about 400 square miles at its peak.

Although the red tide has vanished completely, the FWS warned that it might reappear if climatic conditions become favorable again.

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PHYSICS

Tritide in H-Bomb?

In Eniwetok experiments, leading to the development of thermonuclear weapons, according to the AEC, uranium or plutonium tritide was almost certainly exploded.

► URANIUM OR plutonium tritide was almost certainly exploded in the Eniwetok experiments that the Atomic Energy Commission cryptically explained are leading to the development of thermonuclear weapons—familiarily called H-bombs.

The tritide is a compound of the older fissionable element, uranium or plutonium, and the most likely of the fusionable light-weight elements, tritium, or triple weight hydrogen. It is the simplest and most intimate way to bring together the fissionable stuff of the now familiar A-bombs and the light element that should have its mass converted into energy under the sun-like immense heat of the fissioning of the A-bomb.

The big question that the AEC announcement does not answer, except by inference, is whether the tritium acted the way expected theoretically. Presumably the answer comes from the power generated in excess of that of a plutonium bomb without the tritium in it. Since all the tritium might not be used or fused, the success of the experiment would also be measured by chemical analysis of the debris in the air after a blast.

A Soviet agent measuring the power of an experimental blast might know little more than anyone else not in the AEC "knows" of all the facts of the experiment. For there are little and big A-bombs now and there undoubtedly are varied amounts of the fusionable tritium being used. What is in the explosion needs to be known to judge the success of the experiment.

Tritium, the triple weight hydrogen or isotope mass three, is not the only possible fusionable element. There is also ordinary hydrogen, mass one, and deuterium, mass two. The scientific betting is that ordinary hydrogen and deuterium will not do the job, but you can bet that they are being tried nevertheless.

If the lighter and slower-acting hydrogens can be used, H-bombs would be cheaper and easier to make. Perhaps all the hydrogen will not need to be tritium, as a mixture of tritium and deuterium may be made to react successfully by a plutonium explosion.

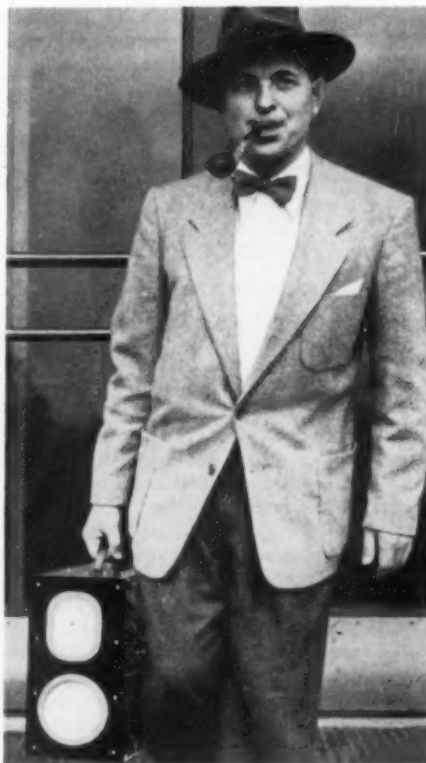
Some of these questions may have been long since answered by small-scale laboratory experiments not involving explosions, but some may not be determined without an actual test explosion.

In the Nevada series of atomic tests last year some of the H-bomb information may have been obtained. The determination of the smallest size of A-bomb that would explode would be useful for H-bomb man-

ufacture as well as for making a bomb to be delivered by the new atomic cannon recently unveiled.

One of the Nevada series did not explode, and it may not have been a failure but merely an intended "dud" that proved the lower limit of the size of the fissionable material needed for an A-bomb to explode. For a certain amount of plutonium must be put in one place, probably about 50 pounds or so, in order to explode. A smaller quantity than this critical mass is safe.

The present Eniwetok explosions have similarly bracketed the possibilities, you may be sure. More tritium or other hydrogen would be crowded into the bomb than the experts believe will be fused successfully. The tritium would be placed in the bomb in the form of a gas, or a



PORTABLE TV VIEWER—George C. Sziklai of the David Sarnoff Research Center at Princeton, N. J., carries an experimental battery-operated TV receiver. The set, weighing only 27 pounds, uses transistors entirely, except for the five-inch kinescope picture tube.

liquid or frozen to a solid. Most likely is tritium combined chemically to be a solid, as with plutonium or uranium 235.

Exploration may be including tests upon the changing of the mass of some of the other light elements, such as lithium, into energy under the immense heat of the A-bomb.

If the first H-bomb has been successfully exploded, it may take more than the few weeks from Alamogordo to Hiroshima to have a successful military weapon that could be used in combat.

Is the H-bomb actually or potentially a thousand or a hundred times the power of the A-bomb? What is the destruction factor?

We probably shall not know until the Smyth report on the H-bomb, or thermonuclear reaction, is written and issued—if it ever is.

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PHYSICS

More H-Bomb Tests Scheduled at Eniwetok

► A NEW joint task force will go to Eniwetok to conduct more bomb tests sometime within the measurable future, SCIENCE SERVICE has learned. Other tests are planned for Nevada, it was also learned.

The task force now at Eniwetok which has tested a research H-bomb is already in the process of packing up and coming home. A complete report of its test of a thermonuclear weapon was probably on President Truman's desk when President-elect Eisenhower visited him on Nov. 18.

These task forces are expensive. They transport up to 30,000 military and civilian personnel out to Eniwetok, take care of them for several months and then bring them back. The 1951 trip cost taxpayers something like \$115,000,000, exclusive of the cost of the bombs which were exploded. The 1952 job probably cost more.

Nevada tests are cheaper, but there is greater danger either from spies or from what might happen if the scientists lost control. Tests of H-bombs and the materials which go into them must be conducted in as isolated a spot as possible, it is believed.

Plans to go to Eniwetok again mean that more research tests are necessary before the construction of an H-bomb to be used against enemy forces can begin. Construction of H-bombs in any number awaits completion of the great Savannah River plant in South Carolina.

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Metal food containers must be distributed carefully throughout the Navy's new non-magnetic minesweepers to prevent concentrations of magnetic materials from exploding nearby mines.

The sting ray's stinger is a sharp-pointed, saw-edged barb that lies in a groove on top of the ray's whip-like tail.



AID TO NAVIGATION—Readying a horseshoe crab's optic nerve for a bath of polarized light, Talbot H. Waterman, zoologist at Yale University, starts cutting out the eye. After separating the optic nerve, he will attach the slender fibers to the electrodes shown resting on the microscope stage. The nerve's reaction to the invisible rays will be of aid in the search for a polarized light compass.

MEDICINE

Clue to Cancer Spread

► **HOW CANCER** cells spread from one part of the body to other and distant parts may be discovered through a method developed by researchers at Jackson Laboratory, Bar Harbor, Me.

This cancer cell spread, called metastasis, has been produced experimentally for the first time by the new method. The metastasis was produced in a strain of mice normally resistant to a specific transplantable tumor.

The method consists, briefly, in injecting frozen dried tumor material into the mice before implanting the living tumor and then giving the mice injections of cortisone, famous adrenal gland hormone. The cortisone apparently facilitated the mouse body's ability to handle the cancer graft after the injection of frozen dried tissue had first weakened its resistance.

Scientists responsible for this achievement are: Dr. Norman Molomut of the

Waldemar Medical Research Foundation, New York; Dr. David M. Spain of the Westchester County Department of Laboratories and Research, Valhalla, N. Y.; Sidney Gault, research fellow at Jackson Laboratory, and Leonard Kreisler, a summer student at Jackson Laboratory now in his first year at New York Medical College. They report their findings in the *Proceedings of the National Academy of Sciences* (Nov.).

Dr. C. C. Little, director of Jackson Laboratory, calls the achievement a significant and encouraging "milestone of progress." He points out that through the new technique scientists may have better conditions for testing the value of chemicals for treating cancer. They may also be able to learn more about how metastasis starts and is maintained and "perhaps some day how it can be checked or prevented."

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CHEMISTRY

Aureomycin Chemical Structure Discovered

► **THE CHEMICAL** structure of aureomycin, one of the Big Five antibiotic drugs, has now been discovered in Pearl River, N. Y.

Synthesis of this famous mold remedy is now possible on a laboratory scale although a practical synthesis for commercial purposes is said to be "highly improbable."

The discovery of aureomycin's chemical structure by a group of eight Lederle Laboratories scientists, however, can lead to: 1. discovery of how antibiotic drugs work; 2. production of better "wonder drugs" at reduced prices.

Aureomycin is found to have a high oxygen content throughout its molecule. It is also amphoteric, meaning it can combine with both acid and alkaline substances. These two newly discovered features account for the speedy effectiveness of the drug in all parts of the body and its freedom from chronic toxicity effects.

The Lederle scientists who worked out the aureomycin formula are: C. W. Waller, B. L. Hutchings, C. F. Wolf, A. A. Goldman, R. W. Broschard, J. H. Williams, W. J. Stein and P. W. Fryth. The formula is reported in the *Journal of the American Chemical Society* (Oct. 5).

Science News Letter, November 29, 1952

PSYCHOLOGY

What Men and Women Think of Both Sexes

► **WHAT DO** men think of women? What do women think of men? What do the sexes think of themselves?

The views in each case are surprisingly uniform, according to a study by Drs. Alex C. Sheriffs and Rheem F. Jarrett, psychologists of the University of California. They obtained their material from results of a 58-point questionnaire.

Both men and women think that women excel in faithfulness in marriage, moral character, imagination, poise, and in understanding of the needs of children.

There was pretty uniform agreement, also, that women are more predisposed to insanity, grudges, violent outbursts of temper, and make a greater effort to "keep up with the Joneses."

Both sexes agree that men are more courageous and intelligent, show the greatest emotional balance in crises, are less likely to go into debt, and are more likely to violate the sexual codes.

There was general agreement that little difference could be found between the sexes in the following situations: who is the most courageous in the face of pain, who is the most creative, the poorest losers at sports, the most stubborn in defending a view against overwhelming evidence that it is incorrect.

Science News Letter, November 29, 1952

MEDICINE

Curled Esophagus More Frequent Among Aged

► "CURLING" OF the esophagus, a life-threatening condition that once was very rare, will afflict more and more people as our population ages.

This prediction was made by two radiologists from the Mobile, Ala., Infirmary at the meeting of the Southern Medical Association in Miami.

They are Drs. Marshall Eskridge and John Day Peake.

In this condition, X-ray pictures of the esophagus, or food passage from the throat to the stomach, show a corkscrew or coiled effect of the esophagus. The cause of the condition is not known, although there are many theories.

Typical victims of curling of the esophagus are nervous, high strung persons over the age of 50 who usually also have other sickness, such as stomach ulcers or cancer, heart trouble, gallbladder disease or parkinsonism.

The patient's chief complaint is usually difficulty in swallowing. He may feel a pain back and below the breast bone. This pain may run up to the chest, neck, ear or jaw. It usually comes with eating or drinking and may be worse with different foods or drinks. It is not always connected with eating, however, and may wake the patient at night. It can seem like gallbladder pain, ulcer pain or the pain of heart trouble.

If the esophagus is so curled that it is completely closed, the patient may not be able to swallow at all and will be in danger of starving to death unless an artificial opening is made into his stomach.

Unfortunately, treatment of the condition is disappointing. Some patients do not have symptoms and the condition is only discovered in the course of X-ray examination for other conditions.

Science News Letter, November 29, 1952

AERONAUTICS

Proposed Convertiplane Has Helicopter Lift

► RUMOR FROM Poland of a new Soviet fighter airplane that can take off and land vertically, needing no runway, is without definite support but it calls attention to plans in America for a plane with conventional propulsion but which would take off and land like a helicopter.

Convertiplane is the name used for this proposed craft. It is not intended to be a fighter but a plane for private use. Flying would attract many more persons than it does now, it is thought, when an airplane becomes available that needs no take-off and landing runway, but which can fly forward in the air at the speeds of conventional airplanes.

The helicopter requires no runway, but is a short-range aircraft and relatively slow in forward flight. The speed limit for

helicopters is around 100 miles an hour, which is a slow pace for long distances.

The proposed aircraft would be a combination of helicopter and conventional plane. Rotary wings, like those of the helicopter, would be used in vertical ascent and in landing. Once safely off the ground, conventional propellers on its nose or wings, or turbojet propulsion, would give it forward movement comparable with other airplanes.

Aviation experts have faith enough in the convertiplane to have organized a group to promote the idea. They will meet at Franklin Institute, Philadelphia, on Dec. 12, to discuss technical and other problems, with the aim of promoting interest in the development of means to combine the flight characteristics of fixed wing and rotary wing aircraft.

Science News Letter, November 29, 1952

TECHNOLOGY

New Silicone Rubber In Airplane Deicer

► A NEW, high-strength, stretchable synthetic rubber, useful especially in high-flying airplane deicing systems, has been reported to the American Chemical Society by Dr. F. L. Kilbourne, Jr., research director at the Connecticut Hard Rubber Company, New Haven, Conn.

The rubber displays excellent durability at temperature extremes, a quality that makes it suitable for aircraft deicing systems. A silicone-type rubber, the material does not lose its "bounce" when it gets cold. Furthermore, it resists heat so well that it can be made into oven gaskets.

Although noted for their performance in heat and cold, other silicone-type rubbers cannot be stretched much over 200% and snap under comparatively mild stretching forces. But the new rubber, containing a fine sand as a reinforcing and vulcanizing agent, can stretch more than 600%. A one-inch-square column of it can withstand a pull of 1,900 pounds.

Science News Letter, November 29, 1952

GEOPHYSICS

Earth's Center 8,400 Degrees Hot

► THE TEMPERATURE at the center of the earth's core is a little greater than 8,400 degrees Fahrenheit (4,800 degrees on the absolute or Kelvin scale), Dr. J. A. Jacobs of the University of Toronto has determined through computations based on known relationships within the earth.

The temperature at the boundary of the metallic core and the mantle of material above it is 7,550 degrees Fahrenheit (4,350 degrees Kelvin). Thus the increase throughout the core is only 900 degrees Fahrenheit (500 degrees Kelvin). Dr. Jacobs reported his computations in *Nature* (Nov. 15).

Science News Letter, November 29, 1952

IN SCIENCE

AGRICULTURE

Everglades' Rich Muck Doomed by 2000 A. D.

► THE RICH muck and peat soils of the Florida Everglades may disappear completely by the year 2000 if controls are not put into practice, Victor E. Green, Jr., of the Everglades Experiment Station, warned the American Society of Agronomy meeting in Cincinnati.

Mr. Green said cultivation of rice on flooded Everglades' soil offers the best remedy against soil losses there. The system of terracing necessary in rice culture prevents erosion, he said, while the growing rice maintains the nitrogen and organic matter content and breaks down minerals for plant use.

Rice has been grown continuously in some flooded fields for 4,000 years, indicating its benefit to the soil, he said. However, he said, dry-land rice cultivation does not show the good results on the soil that floodland cultivation does.

Science News Letter, November 29, 1952

GENERAL SCIENCE

Standard Visa Proposed For Foreign Plane Travel

► LESS RED TAPE for international airplane travelers landing in foreign countries is expected with proposals just adopted by the Council of the International Civil Aviation Organization, representing 57 nations, at its meeting in Montreal. The goal is to cut time delays at airports.

Most important are the entrance visas, which are to be simplified and standardized by the proposal. They would show the date on which they expire and the number of entries permitted into a country. They would be printed in two languages, that of the issuing country and also in English, French or Spanish.

Arrangement for direct transit of passengers through a country is provided. This would include transfer from one airport to another without the necessity of visas or inspections. The plan proposes facilitating operation of private planes as well as other non-scheduled traffic, and would permit the entry of aircraft spare parts with less delays so that visiting planes can be rapidly serviced at points of call during international flights.

The International Civil Aviation Organization exists for the primary purpose of promoting international flying. Recommendations of the organization, ICAO for short, must be approved by any nation before becoming effective as far as it is concerned.

Science News Letter, November 29, 1952

SCIENCE FIELDS

ASTRONOMY

Suggest Iron Meteorites Are From Planet's Crust

► SOME OF the meteorites that flash into the earth's atmosphere as "shooting stars" may be lumps from the outer crust of a long-dead planet. Scientists have long thought the iron meteorites were chunks split from the central core.

That they come from the outer crust was suggested by Dr. E. P. Henderson of the Smithsonian Institution, Washington, at a conference on the abundance of the elements held at Lake Geneva, Wis., attended by about 50 astronomers, chemists and physicists from all parts of the country.

Dr. Henderson bases his suggestion that iron meteorites come not from the central core, but from the outer, silicate mantle, on a study of 27 meteorites. They all had surface markings too many and too deep to have been formed during flight through our atmosphere or after falling to earth. He believes that a gas or a liquid was probably confined within the cavities around which the meteorite material was originally formed.

If this is so, he suggests that these meteorites were small inclusions of metal from within the silicate zone, scattered somewhat like "plums in a pudding," and not fragments from the central core.

Science News Letter, November 29, 1952

CHEMISTRY

Pour Out Sugar From Salted Cup of Tea

► SUGAR CAN now be poured out separately from salt when both are dissolved in the same cup of tea. This is indicated by reports at a New York Academy of Sciences meeting.

Improved ion exchange resins which can either take salt out of sea water or hold back the salt and take out organic material were described by Paul N. Craig of Smith, Kline and French Laboratories, Philadelphia, Myer Ezrin and Harold G. Cassidy of Yale University, Arthur W. Davidson and William J. Argersinger, Jr., University of Kansas, Lawrence, Kans., J. I. Bregman of National Aluminate Corp., Chicago, and B. A. Soldano and Sigfred Peterson, Oak Ridge National Laboratory, Tenn.

Complex biological products used in medical research can be purified, according to these scientists, by choosing the best resin for the particular use from among many new synthetic resins recently developed.

How these ion exchange processes work was described by R. M. Wheaton of the Dow Chemical Co., Midland, Mich. Ion

exchange membranes which are responsible for separating such substances as salt and sugar were described at the same session by Karl Sollner of the National Institutes of Health, Bethesda, Md.

The new ion exchange resins combine techniques from the new field of chromatography and the old process of dialysis through a semi-permeable membrane to accomplish separations not able to be made earlier, according to scientists reporting to the New York Academy of Sciences meeting. Chemical changes formerly brought about by fuel-consuming processes can be carried out simply by allowing a solution of the material to trickle through a glass tube packed with one of the new electron exchange resins.

Science News Letter, November 29, 1952

VOLCANOLOGY

Volcano Built Eniwetok Atoll, H-Bomb Test Site

► A VOLCANO, many times more powerful than the H-bomb, built Eniwetok, scene of the H-bomb test.

This was discovered this year by scientists who made drill holes 4,000 feet through the hard crust of coral that covers the atoll to find base rock of volcanic lava. Dr. Harry S. Ladd, U. S. Geological Survey and scientific staff member of "Operation Crossroads," reported this finding to the Geological Society of America.

The significance of this discovery is that scientists now have a new proof of the volcanic origin of coral atolls.

Charles Darwin, father of modern evolutionary theory, was the first to present the idea that coral atolls are built from volcanic origins. During his famous voyage around the world in the Beagle, Darwin noted that atolls are characterized by a circular reef of coral around a central body of shallow water, like a basin of water floating on a pond. The rim of the basin would represent the coral reef; the water in the basin, the center of the atoll, and the pond would be the deep sea.

Darwin deduced from this that an atoll represents the crest of a volcano that rose from the ocean depths. Coral began to form around the rim of the belching cone of fire and lava that was many times more powerful than any man-made H-bomb. Then as the volcano died and began to sink back into the ocean, the coral continued to build up.

Finally the volcano disappeared completely beneath the sea. But it left its mark as the basin of shallow water surrounded by a new coral reef.

This theory of the origin of atolls has long been the most popular among scientists. However, until the borings carried on at Eniwetok by American geologists, there was no definite way to prove it. The recent discovery of volcanic rock beneath the coral crust seems to add to the factual basis for the volcanic origin theory.

Science News Letter, November 29, 1952

OPERATIONS RESEARCH

Chance Tells When Radar Will Play Out

► HOW TO figure out the length of time complicated airborne equipment such as the radar used in guided missiles will last has been revealed for the first time at an open meeting.

The time length itself is still a military secret, but the method for figuring out the breakdown time was told to scientists attending the first national meeting of the Operations Research Society of America in Washington.

Dr. D. M. Boodman of the Operations Evaluation Group working at the Pentagon reported that there are three possible sources of failure of mechanical equipment: manufacturing defects that can be eliminated by more thorough inspections; worn out parts for which an adequate number of replacements must be kept on hand, and chance, such as the number of rough landings undergone. It was the chance possibility for which Dr. Boodman presented the mathematical formulas to tell how long equipment will last.

The more complicated the electronic equipment, the shorter the time before it gives out. TV sets are probably rugged devices compared to some of the electronic equipment now being developed for jet airplanes. It is possible, Dr. Boodman suggests, that the United States is now reaching the point where it is too expensive to produce, install and maintain more complex radar equipment for the value received from the extra job such devices do.

Science News Letter, November 29, 1952

ENTOMOLOGY

Invading Pests Stopped At Borders of Nation

► SABOTEURS THAT can cause great damage to American food production if they are not caught in time are constantly trying to get into the United States. And catching them before they do is the job, not of the Federal Bureau of Investigation, but of the U. S. Department of Agriculture.

These enemies are insect pests and plant diseases that slip into this country with imported goods, food and animals, or on the clothes of passengers. The job of the department's Bureau of Entomology and Plant Quarantine is to intercept these invaders before they cross the border.

For the fiscal year of 1950-51, the bureau reported 7,684 cases of harmful insects and plant diseases detected and kept from entry into the United States. Nearly 5,000 of this total were insects, any of which might have caused great damage to agriculture if it had become established here.

Plant diseases, like a narcissus fungus brought over with bulbs from Holland, were found in 2,776 cases. The destructive giant African snail was discovered in several cargoes from the Far East.

Science News Letter, November 29, 1952

ASTRONOMY

Venus Still Brightens

Winter constellations now beginning to appear. Stars are classified by their apparent brightness into magnitudes, the difference between each magnitude being 2.5.

By JAMES STOKLEY

► WITH THE coming of December, the planet Venus is more conspicuous than it has yet been on this appearance and shines brightly in the southwestern evening sky.

It is now so bright, of magnitude minus 3.6 on the astronomical scale, that it can be seen long before the sky is completely dark, and before any other star or planet comes into view.

Venus sets, however, a little too soon to be depicted on the accompanying maps. These show the appearance of the heavens at about 10:00 p.m., your own kind of standard time, at the first of December, an hour earlier in the middle, and two hours earlier at the end.

Venus is in Capricornus, the sea-goat, which is just below the constellation of Aquarius, the water-carrier, shown low in the southwest.

In this same part of the sky there is another planet, Mars, which is shown, though it is only about a seventy-fifth as bright as Venus.

High in the south, however, there shines the planet Jupiter, which is second brightest, since it is more than a quarter of the brilliance of Venus. This is shown on our map in Aries, the ram, and its brightness makes it easy to locate.

Winter Constellations Appear

In the southeast we can now see that brilliant array of stars that make the winter evening sky so glorious. Brightest of these is Sirius, the dog-star, in the figure of Canis Major, the great dog.

Directly above is Orion, the warrior, easily identified by the three stars in a row that form his belt. Above and to the left of the belt is Betelgeuse, while below and right we find Rigel.

A little to the left of the lower part of Orion we see Canis Minor, the lesser dog, with the star Procyon. Directly over this group Gemini, the twins, can be seen. This is a constellation containing two rather bright stars, Castor and Pollux. The latter is of the first magnitude.

Going upward from Orion, one comes to Taurus, the bull, with Aldebaran, distinctly red in color, to mark the eye of the beast. To the left of Taurus stands Auriga, the charioteer, with the star Capella as the brightest in the constellation.

Aside from these stars in and around Orion, there is only one other of the first magnitude that is shown, and that is so low

that it appears considerably fainter. This is Vega, in Lyra, the lyre, near the north-western horizon.

Because of the low altitude, its light has to pass through a much greater length of atmosphere than when it was high overhead. This absorbs much of its light and makes it appear faint, so it is shown with the symbol for one of the second magnitude.

In addition to Venus, Jupiter and Mars, the other two naked-eye planets may also be seen, though much later at night. Saturn, in the constellation of Virgo, the virgin, rises about 3:00 a.m. at the beginning of December and about 1:00 a.m. at the end.

Stars' Brightness Differs

On the 18th, Mercury is farthest west of the sun, then rising about an hour and three quarters before sunrise. For a few days around this date, it can be glimpsed near the southeastern horizon as dawn is breaking.

Looking at the night-time sky, one cannot fail to notice that, as Paul wrote to the Corinthians, "one star differeth from another star in glory." Some are bright, some are faint, and with the aid of telescopes, we can observe others much too dim to be seen at all with the unaided eye.

Of course, there are two reasons for the seeming differences in the brightness of the stars. Some really are many times brighter than others. In addition, they are at widely separated distances.

The brightest of all the night-time stars, Sirius, for example, is actually not very

brilliant as stars go, even though it does exceed the sun some 26 times. It happens to be very close, and that is why it looks so bright. In contrast, Rigel, the lower bright star in Orion, is about 14,700 times as bright as the sun, but it is about 62 times as far away as Sirius, which makes it look fainter.

Hipparchus First to Classify

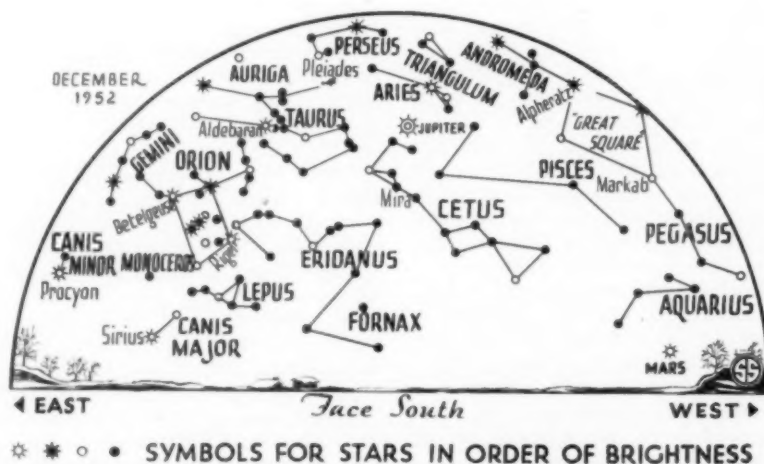
About 150 B. C., a Greek astronomer named Hipparchus classified the stars by their apparent brightness into six "magnitudes." Some 20 of the most brilliant he lumped together as the first magnitude. The vast number that could barely be seen he called sixth magnitude, while those of intermediate brightness he put into the second, third, fourth and fifth.

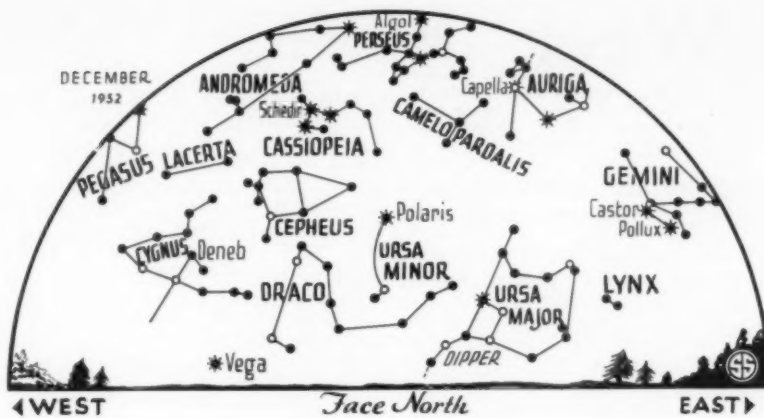
A century ago, utilizing newly invented instruments which made it possible to measure star brightnesses with greater accuracy than ever before, an English astronomer named Pogson put the magnitude system on a more scientific basis than it had been previously.

He set the difference between one magnitude and the next at 2.5 or, more accurately, 2.512. This was about the ratio that Hipparchus had happened to choose, and so meant the least alteration in the old system. But also, with this ratio, a difference of five magnitudes is exactly 100. Thus a first magnitude star is just 10 times as brilliant as one of the sixth magnitude.

Decimal Magnitudes

To take care of differences in brightness smaller than this ratio, decimal magnitudes are used. That of Pollux, for example, is 1.21, but that of Castor, also in Gemini, the twins, is 1.58, which is nearer to two, so it is called second magnitude.





There was a question, however, as to how to handle much brighter stars, like Sirius, which is 11 times as bright as a star of magnitude 1.0. Since the brighter the star, the lower is the magnitude number, it was necessary to go to numbers lower than unity, that is, to zero and still farther down to minus numbers.

Thus, the magnitude of Sirius is minus 1.58. This system makes it possible to go down far enough to include the sun, whose magnitude is minus 26.84, which means that it is about 63,000,000,000 times the brightness of a typical first magnitude star. Among the stars shown on our maps of the December skies, Capella may be taken as a star of zero magnitude, since it is 0.21. The middle star of the belt of Orion, sometimes called Alnitak, is 1.8, so that is close to being a typical star of the second magnitude.

Sixth Magnitude Visible

A star of magnitude 3.0 is zeta Tauri, which is the one in the constellation of Taurus shown at the end of the line extending eastward from Aldebaran. The two stars just below Aldebaran are of fourth magnitude.

Although under good conditions, such as a dark, clear sky far away from city lights, one can see stars down to the sixth

magnitude with the naked eye, these maps do not show those fainter than fourth. With big telescopes, of course, much fainter stars may be detected.

The 200-inch Hale telescope at the Palomar Observatory in California will photograph stars down to the 22nd magnitude. Probably it would be possible to see a star as faint as the 20th magnitude by looking through that instrument.

Celestial Time Table for December

Dec.	EST
1	7:41 a.m. Full moon.
6	3:09 a.m. Algal (variable star in Perseus) at minimum brightness.
7	10:00 p.m. Moon farthest, distance 251,300 miles.
9	8:22 a.m. Moon in last quarter.
11	8:47 p.m. Algal at minimum.
12	early a.m. Meteors visible radiating from constellation of Gemini.
	3:17 p.m. Moon passes Saturn.
14	5:37 p.m. Algal at minimum.
15	8:53 a.m. Moon passes Mercury.
16	9:02 p.m. New moon.
18	5:00 p.m. Mercury farthest west of sun, visible before sunrise for a few days around this date.
19	4:00 p.m. Moon nearest, distance 227,000 miles.
20	2:38 a.m. Moon passes Venus.
21	9:21 p.m. Moon passes Mars.
21	4:44 p.m. Sun farthest south, winter commences in northern hemisphere.
23	2:51 p.m. Moon in first quarter.
29	1:42 a.m. Algal at minimum.
31	12:05 a.m. Full moon.
	10:31 p.m. Algal at minimum.

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, November 29, 1952

INVENTION

Typewriter Paper Kept Straight by Patent Device

► PARALLEL BARS evenly spaced on a typewriter's platen and parallel rings around it at each end enable the typewriter operator to be sure that his paper is in straight at all times. Inventor is Carlos C. Goetz, New York, and patent number is 2,618,372.

Science News Letter, November 29, 1952

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THE ACTIVITIES OF THE INDUSTRIAL HYGIENE FOUNDATION—*Mellon Institute*, 13 p., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Explaining the functions of this non-profit research association.

THE ADVANCEMENT OF SCIENCE, VOL. IX, No. 34, September, 1952—*British Association for the Advancement of Science*, 163 p., illus., paper, six shillings. Containing the addresses of the president, and the presidents of the sections at the centennial meeting of the Association.

ADVANCEMENTS IN WOOD RESEARCH AND TIMBER ENGINEERING—*Timber Engineering Company*, 31 p., illus., paper, free upon request direct to publisher, 1319 18th St., Washington 6, D. C. Describing research in the use and treatment of wood.

THE ATOMIC ENERGY ACT OF 1946 WITH AMENDMENTS THROUGH THE EIGHTY-SECOND CONGRESS—Joint Committee on Atomic Energy, Carl T. Durham, Chairman—*Govt. Printing Office*, 83 p., paper, free upon request to the House Document Room, U. S. Capitol, Washington 25, D. C. A collection of statutory material concerning the development and control of atomic energy.

AVON SCIENCE FICTION AND FANTASY READER, Volume 1, Number 1—Sol Cohen, Ed—*Avon*

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A CONTRIBUTION TO THE THEORY OF THE LIVING ORGANISM—W. E. Agar—*Melbourne University Press (Cambridge University Press)*, 2d ed., 235 p., \$3.75. Of interest to the philosophical reader concerned with biology.

EVOLUTION IN THE GENUS DROSOPHILA—J. T. Patterson and W. S. Stone—*Macmillan*, 610 p., illus., \$8.50. An analysis of what the fruit fly has contributed to knowledge of evolution during the present century.

FACTS ABOUT FOODS—H. J. Heinz Company—*Mellon Institute*, 16 p., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Contains a table showing the nutritive values of various foods.

THE FIRST BOOK OF BEES—Albert B. Tibbets—*Franklin Watts*, 69 p., illus., \$1.75. Telling children of the structure, habits and social life of these useful insects.

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THE FIRST BOOK OF WATER—Jo and Ernest Norling—*Franklin Watts*, 45 p., illus., \$1.75. Telling children what they want to know about water, not just in the drinking glass or the bathtub, but in clouds, snow and the ocean.

THE FORGOTTEN REPUBLICS—Clarence A. Manning—*Philosophical Library*, 264 p., illus., \$2.75. Pushed this way and that by the Germans on one side and the Russians on the other, the Baltic countries, Estonia, Latvia and Lithuania nevertheless have kept their individuality. Here is an introduction to them.

GENERAL AND INORGANIC CHEMISTRY—P. J. Durant—*Longmans, Green*, 2d ed., 671 p., illus., \$4.50. Important additions in this new edition are two new chapters on colloids and nuclear chemistry.

A HISTORY OF SCIENCE: Ancient Science Through the Golden Age of Greece—George Sarton—*Harvard University Press*, 646 p., illus., \$10.00. The intention of the author in this book was to reproduce not only the letter, but the spirit of his lectures which have captivated so many audiences.

THE INDIAN TRIBES OF NORTH AMERICA—John R. Swanton—*Govt. Printing Office*, 726 p.,

illus., \$3.50. Giving historical and linguistic information, origin of tribal name, location and other data.

INSECT ENEMIES OF WESTERN FORESTS—F. P. Keen—*Govt. Printing Office, USDA Misc. Pub. No. 273*, 280 p., illus., paper, \$1.00. Thousands of insect species are found in our forests. Some are beneficial, clearing up the debris on the forest floor. Worst of the harmful insects is the bark beetle which has killed more than 36 million trees in one national forest alone.

JOURNAL OF THE OPERATIONS RESEARCH SOCIETY OF AMERICA, VOLUME 1, NUMBER 1—Thornton Page, Ed.—*Operations Research Society of America*, 32 p., paper, \$1.50, \$6.00 per year. Operations research is a new science developed during the war to handle such practical military problems as how to plan the pattern for submarine search. It now is finding non-military uses.

MANUAL OF PHOTOGRAMMETRY—George D. Whitmore and others—*American Society of Photogrammetry*, 2d ed., 876 p., illus., \$12.50. Providing in a single volume the modern American practices for professional and lay workers in photogrammetry, which is the science of obtaining reliable measurements from photographs.

MARKETING AND MANUFACTURING SERVICES AND MARGINS FOR TEXTILES—L. D. Howell—*Govt. Printing Office, USDA Technical Bulletin No. 1062*, 294 p., paper, 60 cents. Because cotton and wool grown in the United States face competition from foreign-grown and synthetic fibers, increased efficiency in the whole chain of marketing is important.

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THE ORTHOPEDIC APPLIANCES PROGRAM AT MELLON INSTITUTE: The First Five Years—George H. Young—*Mellon Institute*, 13 p., illus., paper, free upon request direct to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

THE PHILOSOPHY OF PSYCHIATRY: Psychiatric Prolegomena—Harold Palmer—*Philosophical Library*, 70 p., \$2.75. The intention of the author is, by defining the terms he employs, to help establish a theory and practice of psychiatry which can be communicated and thus contribute to the science of ecology.

A PHYSIOLOGICAL APPROACH TO THE LOWER ANIMALS—J. A. Ramsay—*Cambridge University Press*, 148 p., illus., \$2.75. The author has restricted himself to such parts of the subject as are susceptible to broad generalization. Exceptions are omitted on the theory that students

would know that any broad generalization must have exceptions.

PSYCHIATRY AND THE LAW—Manfred S. Guttmacher and Henry Weihofen—*Norton*, 476 p., \$7.50. The chief medical officer of the Supreme Bench of Baltimore, a psychiatrist, has joined efforts with a professor of law at the University of New Mexico to produce this practical guide on medicolegal psychiatry for students and practitioners of law and medicine.

QUANTITATIVE ANALYSIS—William Marshall MacNevin and Thomas Richard Sweet—*Harper*, 247 p., illus., \$3.75. A short text with experiments selected for the needs of chemistry majors, and pre-medical and pre-pharmacy students.

STANDARD AIRCRAFT HANDBOOK—Stuart Leavell and Stanley Bungay, Eds.—*Aero*, 159 p., illus., paper, \$1.50. A pocket-size reference book for aircraft workers.

STUDIES IN ELASTIC STRUCTURES—A. J. S. Pippard—*Edward Arnold*, 361 p., \$11.50. Concerning the stresses in such structures as rings, wheels, bridge girders, lattice frames and arches.

THEORY OF ELECTRIC POLARISATION—C. J. F. Böttcher—*Elsevier*, 492 p., \$10.00. For advanced students and experimental workers in both chemistry and physics. Written directly in English by the professor of physical chemistry at the University of Leyden, Netherlands.

WELLSPRINGS OF DEMOCRACY: Guidance for Local Societies—John M. Brewer—*Philosophical Library*, 232 p., \$4.50. By conducting our local societies in a genuinely democratic way, we build democracy on a firm base, the author believes. Here are instructions to guide presiding officers and members.

Science News Letter, November 29, 1952

INVENTION

"Cocktail Shaker" Washes Stockings

► A SILK, or nylon, stocking washer, the size of a cocktail shaker, has been invented by Donald McConaughy, Darien, Conn. Vanes inside produce a whirling motion in the soapy water when the washer is shaken up and down. The stockings can be rinsed in the same container. The patent is number 2,618,143.

Science News Letter, November 29, 1952

GEOLOGY-BOTANY

Plants Spot Uranium

The kinds of plants that grow in various regions of the western states are clues to nearby valuable deposits of uranium and vanadium.

► PLANTS CAN be used to spot deposits of uranium and vanadium in the western states, a U.S. Geological Survey scientist has revealed.

The kinds of plants growing in the area are a clue to the valuable ore deposits. Analysis of the leaves of the plants will also tell if the plant has grown in uranium or vanadium ores. Certain plants can thus be used as a guide to exploration in a particular area. Dr. Helen L. Cannon concludes after a two-year survey of the plants of the Colorado Plateau. The study was part of a long-range program to explore and investigate uranium deposits being conducted by the Atomic Energy Commission.

Commonest of the uranium-indicating plants are rabbitbrush, shadscale, mormon tea, milkvetch and grasses. Junipers, scrub oak, serviceberry and cliffrose are also indicators.

Too much uranium makes plants ill, Dr. Cannon reports. This happens mainly on disturbed ground, where the ore metals are exposed to air and rain, making them soluble and available to the plants.

"Considerable uranium and vanadium" are absorbed by the roots of plants, and some work their way to the twigs and

leaves, where they can be detected by chemical analysis. Leaves of plants rooted in ore contain two to 100 parts per million of uranium, while the normal amount in plants where there are no uranium deposits is less than one part per million.

Science News Letter, November 29, 1952

GENERAL SCIENCE

Plan World Meeting On Childlessness

► MORE PEOPLE in the United States suffer from inability to have wanted children than from cancer, tuberculosis, heart disease, diabetes, cerebral palsy and poliomyelitis combined, Dr. Abner I. Weisman of New York, associate secretary general of the International Fertility Association, declared in New York.

To help these 15,000,000 Americans who are victims of barren marriages and the 10% of the world's population similarly afflicted, his association and the American Society for the Study of Fertility will sponsor the world's first Congress on Fertility and Sterility in New York next May 26-31.

Science News Letter, November 29, 1952

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PHYSICS

Superposed Sound Waves

Two "bangs" in succession are sometimes heard by spectators along the approach path of an aircraft that breaks through the sonic barrier.

► THE TWO distinct "bangs" heard by ground spectators at the recent Farnborough airshow when an approaching airplane broke the so-called sonic barrier have awakened much interest relative to the cause, and several possible explanations have been offered by aviation authorities.

The bangs, explosive sounds like that of gunfire, were heard when a de Havilland 110 achieved a speed faster than that of sound. In one test it achieved supersonic speed by diving from a height of over two miles. The following day the same plane attempted to exceed the speed of sound in a low-altitude flight but disintegrated in the air, bringing death to its two crew members and to over a score of spectators struck by flying debris.

The phenomenon of two explosive sounds in succession sometimes heard on the ground by persons along the approach path when an aircraft in the vicinity breaks the sonic barrier is not new to scientists. It is, however, new to the public because

few public exhibitions of such speedy flights have been held. The two bangs heard at Farnborough were less than a second apart, but each was distinct. Spectators said that they were as powerful as the backlash of a light artillery piece.

In a recent issue of *Nature* (Nov. 8), T. Gold of Trinity College, Cambridge, offers one explanation. In *Flight* (Oct. 3), a British aeronautical weekly, A. H. Yates of the College of Aeronautics, Cranfield, outlines two possible explanations. Both are technical discussions but the two aeronautic experts seem to agree that the explosive effect comes when two separate sets of sound waves reach the ear of the observer at the same time, one superimposed on the other.

When an airplane is traveling at ordinary speeds, the noise made by it and its engines travels in sound waves away from it in all directions. When it travels at the speed of sound, the noise emitted travels for a few moments along with it.

But when it travels faster than sound, the noise, that is, the sound waves, is left behind.

The first bang received from the diving aircraft, according to Mr. Yates, is from around the height at which the dive slows to subsonic speeds. The rate at which the sound is received is very large, and produces the bang.

Immediately afterwards the sound emitted during the supersonic period follows, arriving at the same time as that emitted at lower altitudes. Then follows a bang produced when the aircraft first became supersonic. This energy, emitted at great altitude and left behind by the diving plane, arrives a fraction of a second behind the first bang.

The bangs originate when the plane passes from a subsonic to a supersonic speed, and again when decreasing from the supersonic to the subsonic. The second bang is heard first by ground observers ahead of the plane because it has less distance to travel.

Science News Letter, November 29, 1952

OPERATIONS RESEARCH

People Talk Louder Phoning Long Distance

► THE LONGER the distance over which you are making a long distance telephone call, the louder you talk.

Dr. V. Subrizi of the Bell Telephone Laboratories, New York, told the first national meeting of the Operations Research Society of America in Washington that he had found that "speech volumes increase about one and a half decibels for every 1,000 air miles" added to the length of the telephone connection.

Science News Letter, November 29, 1952

SURGERY

Removing Brain Cells May Cure Epilepsy

► HOPE THAT cerebral palsy, epilepsy and other brain ills may some day be cured by surgical removal of the abnormal brain cells so that their functions may be taken over by nearby healthy cells was seen in experiments reported in New York.

The research, conducted by Dr. Robert W. Doty of the University of Utah, was reported to the Fourth Symposium on Cerebral Palsy at the New York Academy of Medicine.

Sections of the visual centers of the brains of cats were removed and then by use of visual exercises, Dr. Doty determined how fast the brain reorganized and new cells learned the duties of those that were lost.

Youth was an aid to recovery, Dr. Doty found. Adult cats required the most time to get back their normal vision. And they needed the most help in retraining. Best results were obtained with kittens operated on within 24 hours after birth.

Dr. Doty hopes that some day it may be possible to operate early in life in the cases of brain disease or brain injury. This may prevent the spread of the abnormality to healthy cells and may make it possible for nearby cells to take over the functions of the missing brain tissue at a time when this most readily takes place.

Science News Letter, November 29, 1952

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Questions

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ENGINEERING—What uses are foreseen for prestressed ceramics? p. 340.

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BIOCHEMISTRY

Virus Seizes Cell Prey

Chemical groups of atoms on the cell's surface are used by bacterial virus to snag its victim, studies with bacillus tagged with radioactive phosphorus show.

► A BACTERIAL virus takes hold of its cell victim by means of particular chemical groups of atoms on the cell's surface. This strategy in submicroscopic germ warfare has been discovered by Drs. L. J. Tolmach and T. T. Puck of the University of Colorado Medical Center. They report their discovery in the *Journal of the American Chemical Society* (Nov. 5).

Two viruses, T1 and T2, labeled with radioactive phosphorus were studied in their combinations with a culture of a colon bacillus, named *E. coli* B, in the experiments of the Colorado chemists. They treated the bacillus cells with a number of chemical reagents to modify their chemical structure. They then traced the effect on the cells of adding one or the other of the labeled viruses.

Although the radioactive phosphorus in the structure of the virus permitted it to be followed and its fate learned, the results obtained by Drs. Tolmach and Puck rule out the possibility that phosphoric acid plays an important part in the combination of virus and cell.

Other chemically reacting structures in the cell which these scientists expected to take part in attachment to the virus are the carboxyl, the amino, the sulphydryl and the phenolic-hydroxyl groups. Between these, the tracer experiments of the scientists decided in favor of the first two.

The two types of virus used by the experimenters are not alike in their method of seizing their prey, Drs. Tolmach and Puck report. Virus T2 appears to demand that the cell with which it combines have an intact carboxyl group, the essential structure for an organic acid. It is indifferent to the presence of amino groups in the cell molecule.

Virus T1 insists upon the presence of one or more amino groups, but it is not so particular about carboxyl groups. The specific nature of these combinations is believed by these experimenters to be characteristic of the way organisms can be resistant to some viruses and susceptible to others.

Ionic bonding, which is mainly responsible for chemical combinations among inorganic chemicals, rather than the weaker kinds of association often found between organic chemicals, seems responsible for combinations between virus and cell, according to Drs. Tolmach and Puck, although they do not rule out other kinds of chemical forces.

The difference in the chemical behavior of the cell with the two kinds of virus, according to the Colorado chemists, is evidence of the "blocking of specific chemical groupings on the cell surface, rather than random disorganization of cell structures."

Science News Letter, November 29, 1952

heard underwater and other underwater sounds.

The plane was over the volcano for an hour and a quarter. The scientists were James M. Snodgrass, head of the Scripps division of special services; Douglas L. Inman, assistant research geologist, and Adrian Richards, assistant.

Science News Letter, November 29, 1952

Do You Know?

About 5,000,000 gallons of paint are used annually to mark streets and highways for traffic.

World production of industrial diamonds reached an all-time high of 14,000,000 carats in 1951.

The average American family spends about \$5 for medical care out of each \$100 of family income.

Tiny cannibalistic spiders that live by eating each other have been found at elevations of 23,000 feet on Mount Everest, 4,000 feet above the limit for plant life.

A flashlight-sized dry cell now is being perfected that uses the oxygen of air as one of its reactive ingredients; when exhausted, it can be refueled like a cigarette lighter.

Is Your Child Interested in Science?

If your children are interested in Science, you will want a copy of the new and different *Turtlox Naturalists' Catalog*. This publication is much more than a catalog, for it tells how to study and collect plant and animal specimens, how to start and maintain cultures of micro-organisms, how to make an insect collection, how to make microscope slides and how to embed specimens in crystal-clear plastic. It offers hundreds of suggestions for worthwhile Christmas gifts—not toys, but professional-quality scientific equipment to start the budding scientist in the right direction.

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VOLCANOLOGY

Record Volcano's Sounds

► STRANGE SOUNDS, never heard before by human ear, have been recorded by three Scripps Institution of Oceanography scientists who flew over a new Pacific

volcano 780 miles southwest of San Diego, Calif.

The volcano, San Benedicto, has erupted again. The scientists, flying in a Navy PBM plane, dropped floating sonobuoys that picked up the sounds of the volcano and transmitted them to the plane. There, they were recorded on magnetic tape. The scientists describe them as "something new in recorded sound."

The volcano erupted through two small vents in the lava floor of the crater every five to six minutes. If it builds up enough pressure inside, it might very possibly produce a vast explosion.

The volcano was first reported from a tuna fishing boat as erupting every five minutes, with its flames visible for 40 miles. By studying the recordings, the scientists hope to get some idea of the intensity of volcano sounds at varying distances and to learn to distinguish between volcanoes

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❁ **PHOTOFLASH BATTERY** about the size of a man's thumb stores enough energy to fire 25,000 flash bulbs. Especially designed for use in capacitor cartridges, the battery is made up of 15 dry cells that combine to form a 22½-volt unit.

Science News Letter, November 29, 1952

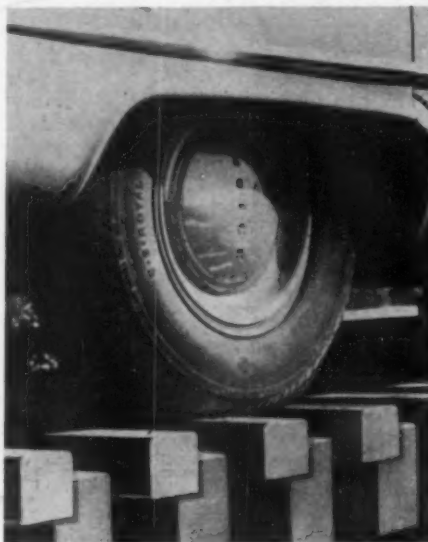
❁ **WINTER TIRE** for passenger cars is said to have high gripping action in loose or hard-packed snow, on ice and in mud, yet it operates smoothly and quietly. Available in standard and white-sidewall designs, the tire uses some of the latest long-mileage rubber compounds.

Science News Letter, November 29, 1952

❁ **COFFEE SERVER** uses a liquid pure coffee concentrate, pure cane sugar, fresh cream and hot water to brew 100 cups of high-quality coffee at a cost between five and 10 cents per cup. Containing its own cooling and heating units, the coffee server operates by coin, or by the flip of a switch in offices where coffee is served free.

Science News Letter, November 29, 1952

❁ **PUSHBUTTON PARKING** system of type shown in the photograph increases garage business, yet reduces number of attendants needed to park cars. Cars are moved automatically onto an elevator, raised to the proper floor, moved sideways



into the parking shelf and are set down. The movable elevator floor is made of parallel beams that slip between smaller beams of the parking shelf.

Science News Letter, November 29, 1952

❁ **CHARGE INDICATOR** for industrial truck batteries has a meter mounted near the truck's controls so the operator can see

at a glance whether the battery is "full," "½," "empty" or in "danger." Easily adjustable for batteries having up to 24 cells, the device can be switched off while the battery is charged.

Science News Letter, November 29, 1952

❁ **ALUMINUM GRILL**, set on a stove burner, cooks eggs, pancakes, sandwiches and French toast. Melted fats run off into a deep gutter surrounding the cooking surface, and can be poured off easily when the cooking is finished. The grill is equipped with "heat-proof" handles.

Science News Letter, November 29, 1952

❁ **NEW FISH LURE** uses rhinestones to attract fish to its multibarbed hooks. Set in black plastic, the flashing "jewels" are foil-backed and can be seen over a wider underwater area than the usual fish-lure spinner devices.

Science News Letter, November 29, 1952

❁ **HOME HUMIDIFIER**, now available as a table-model unit, electrically evaporates into the air more than three gallons of water each day. That is enough moisture to improve comfort in three or four average-sized heated rooms. The increased humidity also helps prevent damage to furniture due to dry air.

Science News Letter, November 29, 1952

• Nature Ramblings •

➤ **WITH THE** Christmas holiday season soon at hand, keeping flowers appearing fresh and attractive in the home is of interest to every flower lover.

There is nothing so disheartening as to have an attractive vase of blooms wilt and hang dejectedly. Various remedies have been offered, from aspirin to zinc dust, but many of them are worthless.

Studies made under carefully controlled conditions point up a few steps that help, and show the worthlessness of a considerable number of others. The freshness and keeping qualities of flowers depend almost entirely upon having an ample supply of moisture flowing through the stem to the flower itself. Anything that increases loss of moisture through leaves and petals shortens the flower's life. And anything that impedes or stops the absorption of moisture by the flower has an equally disastrous effect.

At least 90% of the moisture taken up by the flower is absorbed through the end of the stem. To keep the end of the stem functioning properly, it is essential that it be cut on a slant to prevent its resting squarely

Keeping Flowers Fresh



on the bottom of the vase and thus being unable to take up moisture.

Secondly, the vase should be clean. It should, in fact, be cleaned every day so as to destroy the bacteria that normally clog up the stems. Some chemicals facilitate control of bacteria.

The addition of sugar to the water seems to increase absorption and the pressure of moisture in the cells. Leaves covered with water, especially of marigolds, dahlias and chrysanthemums, decay rapidly and foul the water, thereby increasing the number

of bacteria. These leaves should be removed before placing flowers in the vase.

Copper containers, giving off some of the copper, normally give less trouble with bacteria. However, it is just as easy to wash a vase each day and to shorten the stems as it is to use copper bowls or copper wire in a container. The carnation seems to be the only flower that does not last longer when it is in a copper container.

Keeping the flowers out of drafts, high temperatures and dry situations, conditions that speed the loss of moisture through leaf and petal, prolongs their life. Put them in some cool, moist place, such as porch or bathroom, when not needed in the living room. But even in a warm, dry room, they may be placed in the most favorable corner. Syringing the foliage each day will also help.

To aid in keeping roses and carnations fresh, Ohio State University scientists suggest the following formula: one-half teaspoon alum, one-half teaspoon Clorox; a pinch of ferric oxide and two teaspoons of sugar to a quart of water.

Science News Letter, November 29, 1952